

Routing Planned Process Loss < Routing Theoretical Process Loss * (1 + Tolerance %)

where Routing Theoretical Process Loss may be a calculated value based on the recipe quantity and recipe group.

5

If a change to the recipe or step quantities entails a different theoretical process loss, the planned process loss defaults to the new theoretical value and a warning message may display to indicate to the user that the planned process loss has changed.

10

Still referring to Figure 6, several different information entries may be edited from the recipe step quantity window 610.

15

One such entry is Activity Factor. The concept of factor is the number of times an activity is performed. For example, a quality test may be performed at the beginning, middle and end of a mixing time period. Rather than defining the activity and associated resources three times as was required in the prior art, this new attribute may be used as a multiplier to indicate several iterations of the same activity. In the previous example, the engineer would define a factor of three against the activity test.

20

Factors may be inherited from the routing and can be overridden. They can be set to zero to exclude a particular activity. This may also be a mechanism to select the resources (equipment, labor, etc.) used for this production run within this specific plant.

25

This new attribute applies to resource usage when planning and calculating resource costs.

Another editable quantity is Step Quantity. Depending on the routing configuration, step quantities can manually be maintained by the user or calculated by the system.

5

If step quantities are manually maintained, upon recipe creation, step quantities default from the routing and can be overridden. Changing the step quantity may involve re calculation of charges and operation process loss which in turns triggers the re-calculation of the overall routing process loss.

10

A third editable quantity is capacity. Capacity constraints may be maintained at three or more different levels, including Resource, Activity and Operation.

15

By defining the level at which the capacity constraint is tracked, users may implicitly designate the component to which the number of charges applies. Capacity defaults from the routing upon recipe creation and can be overridden. Changing capacity may involve a change in the number of times (charges) this component (Resource, Activity or Operation) may be executed.

20

Recipe maintenance step quantity window 610 shows that the system has been setup so that capacity limitation is tracked and recorded at operation level.

25

Upon creation of a recipe, the operation planned process loss may default from the theoretical one. This may be changed within a pre-defined tolerance factor, for example:

Operational Planned Process Loss > Operational Theoretical Process Loss * (1 - Tolerance %)
AND

Operational Planned Process Loss < Operational Theoretical Process Loss * (1 + Tolerance %)

where Operation Theoretical Process Loss is a calculated value based on the operation step quantity and operation class.

5

If a change to the recipe or step quantities entails a different theoretical process loss, the planned process loss may default to the new theoretical value and a warning message may display to indicate to the user that the planned process loss has changed.

10

Figure 7 depicts a recipe maintenance throughput window 700, according to an embodiment of the present invention. The recipe maintenance throughput window 700 may display when the user selects a recipe node or selects the Detail button 310 from the recipe summary window 300 or selects tab 700a.

15

Recipe maintenance throughput window 700 may include throughput editor window 710 that contains line items relating to resources that are defined for throughput. As described further below, many fields may be defined for each line, including a count, process quantity, units of measure, and usage (consumption).

20

From throughput editor window 710, users may override default resource use rates previously setup at the operation level. This feature may eliminate the need to have a unique operation and a unique routing whenever the throughput changes due to material variability in terms of chemical characteristics such as viscosity. The user may setup default operations and routings with average material throughput, yet indicate material specific flows at the recipe level.

25